Keywords, Problems, and Group Project

Part I. Keywords

Regression, Ordinary Least Squares (OLS), multi-factor model, t-value and R^2, collinearity, BLUE

CAPM, sources of market inefficiency, profitability, earnings quality, value, momentum, management quality, market sentiment, alpha model

CUSIP, GICS, investment strategies, market neutral, active weight

R treatment functions, run OLS in R and obtain results

Part II. Problems

Problem 4.1 Collect the data for the two companies you picked for the problems in Chaps. 2 and 3, and build signals.

(1) Collect data from quarterly financial statements filed with the SEC: balance sheet, income statement, and cash flow statement.
(2) Collect pricing data and calculate forward returns of 1, 3, 6, 9, 12 months.
(3) Construct quarterly ratios: price momentum, value, profitability, earnings quality, and management quality; merge with the return data by date and cusip.
(4) Apply proper treatments to raw signals.
(5) Conduct univariate analysis of the raw and treated values.
(6) Conduct bivariate correlation (both Pearson and rank) between signals (treated values), and between signals and forward returns.

   (i) Any correlations higher than 30 or 40%?
   (ii) Any return values outside the range of (−50%, +50&)?

(7) Conduct OLS regression using returns as the response variable and signals as factors for each theme.

   (i) Check coefficients, t-value, and R^2.
   (ii) Do the OLS regression results agree with bivariate results? Do the high-correlation signals cause collinearity issue?

Problem 4.2 Build themes with the treated signal data.

(1) Combine signals into themes with weights based on the univariate, bivariate and multi-factor analysis.
(2) Conduct univariate analysis for each theme, bivariate analysis between themes, and multi-factor analysis with all the themes.
(3) Use residual values in case of high correlation between themes.
(4) Change the weights by 5–10% and redo (2), investigate whether the results change significantly.